

Items	Fascioliasis	Paramphistomiasis
(Syn.)	Liver fluke disease – Liver rot	Stomach Fluke Diseases - Rumen flukes – Conical flukes
Def.	- Acute, sub-acute or chronic infectious disease of liver & bile duct of cattle, buffalo, sheep, goat & other animals caused by <i>Fasciola gigantica</i> & <i>F. hepatica</i> & ch. by: - Chronic digestive & Nutritional disturbance - Liver destruction	- Acute parasitic disease of ruminants caused massive infestation of immature stages in duodenum & characterized by: - Hemorrhagic duodenitis - Diarrhea with fetid odor but without blood - Recumbence & death
Etiology	• <i>Fasciola gigantica</i> & <i>Fasciola hepatica</i> - <i>Fasciola gigantica</i> is longer & slightly narrower - <i>Fasciola gigantica</i> is more common & endemic in tropical areas including Egypt - <i>Fasciola hepatica</i> is more common & endemic in temperate & cooler areas - <i>Fasciola hepatica</i> is reported in Egypt - Both of them are leaf shaped trematodes	• <i>Paramphistomum microbothrium</i> - Adult flukes are pink pear shaped & attached to rumen - Immature flukes are fleshy color cause severe damage to small intestine
Life cycle	1- Life cycle of <i>Fasciola</i> is indirect life cycle (Needs intermediate host – Snail) 2- Miracidium must penetrate the snail within 24 – 30 hrs. 3- Encysted metacercaria is the infective stage that can live up to 1 year & remain infective	
Epidemiology		
1- Source of Infection	- Food or water contaminated by Encysted metacercaria. (50000 in calf & 2000 – 23000 in sheep → in paramphistomiasis)	- Infected animals - Snails
2- Mode	- Ingestion of food or water contaminated by Encysted metacercaria	
3- Host	All domestic animals & Human	All domestic animals
4- Factors affecting susceptibility	a- Age → Majority of disease occurs at 4 - 12 months (Yearling animal) while suckling animals are not b- Season → Summer & Autumn seasons have the highest susceptibility	
	1- Course: From hrs. To several months 2- Acute form: [Caused by massive invasion of liver by immature liver flukes]	1- Acute form: • Persistent fetid diarrhea without blood or mucous due to massive invasion by immature flukes

<u>Diagnosis</u>	
1- Field diagnosis	- Depends on case history (<u>Grazing in pasture</u>), Clinical signs & <u>P/M</u>
2- Lab. diagnosis	•Samples: 1- Fecal sample 2- Part of pasture 3- <u>Serum</u> 4- <u>Parts of liver</u> 5- <u>Broken snails</u> •Tests: a- Acute: - Detection of immature flukes in liver after <u>P/M</u> by slicing piece of liver & shaking it in water b- Chronic: 1- Fecal examination by <u>sedimentation</u> or <u>floatation</u> technique for detection of <u>egg</u> (Egg → <u>thin walled</u>, <u>yellowish brown</u>, <u>operculated</u> with <u>embryonic cells</u>) 2- Serology using <u>ELISA</u> <u>694-96</u> 3- Hematology (<u>↓PCV</u>, anemia, Eosinophilia, <u>↑GGT & GDH</u>) <u>Glutamate Dehydrogenase</u> 4- <u>Pasture examination</u> for detection of <u>encysted metacercaria</u> 5- Animals in <u>PPP</u> are diagnosed serologically or by <u>USG</u>
3- Differential diagnosis	<u>Anthrax</u> → Septicemia with congestion of <u>m.m</u> & <u>McFadyan reaction</u> <u>JD</u> → <u>Pea soap diarrhea</u>
Treatment	1- <u>Fasciolid 25%®</u> → Nitroxylin → 10mg / Kg (4CC / 100 Kg) → S/C → Effective against mature flukes only So, Repeated dose after <u>8 wks.</u> •N.B/ Fasciolid has a <u>28 - day</u> withdrawal period so it's <u>not</u> preferred to be used in <u>meat & milk producing animals</u> 2- <u>Rafoxanide®</u> → Rafoxanide → 1cc / 25 Kg → S/C → For <u>acute & chronic</u> cases in <u>cattle</u> that are older than <u>8 wks.</u> And <u>Sheep & goat</u> that are older than <u>4 wks.</u> 1- <u>Albendazole</u> orally could be effective specially in <u>sheep</u> (<u>10 - 15 mg / Kg</u>) 2- <u>Mansonil®</u> → Niclosamide + Salt of piperazine → 1.2 gm. / 10 Kg (In <u>sheep & goat</u>) <u>OR</u> 100-200 mg / Kg (In <u>cattle</u>) → <u>Per OS</u> 3- <u>Ranide®</u> → Rafoxanide → 1mg / Kg for cattle → S/C → Effective against <u>immature</u> only

Prevention & Control

- 1- Strategic prophylactic treatment (4 - 5 times / year)
 - To reduce both No. of flukes & eggs
 - Feed-lot cattle must be treated on arrival & again after 8 wks. With prevention from feeding on grasses
 - Pregnant animals must be treated few weeks before parturition
 - Dairy animals should take a dose in dry period
- 2- Technical treatment by giving another dose if the disease is still present
- 3- Prevent animals from defecation in brackish water
 - Considered as the most important method for control but rearing system in Egypt is difficult to be controlled
- 4- Prevent animals from grazing in infested pasture
- 5- Control of snails:
 - Chemically → using molluscicides (Na sulfate 0.45 Kg / hectare)
 - Physically → by continuous irrigation & drainage
 - Biologically → by using competitors & predators of snails as: Crustatians, fish & aquatic birds

molluscicide

VP		Ascariasis
Items	Verminous bronchitis – Lung worm infestation	
Syn.	- Acute, sub-acute or chronic infectious respiratory disease of ruminants & equines caused by Nematode parasites & characterized by:	- Acute or chronic infectious disease of calves, foals, pigs, cats & dogs caused by Ascaris worms & characterized by:
Def.	- Respiratory distress - Bronchitis & Broncho-pneumonia	- Digestive disturbance - Poor growth in young animals
Etiology	- Dictyocaulus viviparus → affects cattle - Dictyocaulus filaria → affects sheep - Dictyocaulus arnfieldi → affects foals & donkeys	- Toxocara vitulorum → Cattle & buffalo - Toxocara canis → Dogs - Toxocara cati → Cats - Parascaris equorum (50 cm) → Equines - Ascaris suum → Pigs - Ascaris lumbricoides → Man
Life cycle	Dictyocaulus arnfieldi Dictyocaulus filaria Dictyocaulus viviparus 1- Infective stage of D. filaria & D. Viviparus → L₃ 2- Infective stage of D. arnfieldi → <u>Egg containing larva</u>	1- Egg containing L₂ is the infective stage in the life cycle 2- There's no infection with ascaris in equines before 3 months of age 3- In herd, calves may be infected while adults are not because of arrested larvae (<u>Hypobiotic larvae</u>) → L₂ doesn't complete the life cycle but remain dormant inside the tissue of ♀ then prior to parturition it crosses the placenta (<u>Trans-placental transmission</u>) or descend in colostrum or milk (<u>Trans-mammary or Trans-coloustral transmission</u>) → Toxocara 4- The dormant larva (<u>Hypo-biotic</u>) may activate at late pregnancy → develop to adult → shedding of eggs → infection of young calves 5- Ingestion of rodents that are infected with larvae inside their muscles (L₂) 6- Eggs need 5 days to become infective (<u>Egg containing L₂</u>)

<u>Epidemiology</u>		
1- Source of Infection	- Food or water contaminated by <u>Infective stage</u> - Infested animal	- Infested Animal
2- Mode	- <u>Ingestion</u> of food or water contaminated by <u>Infective stage</u>	- <u>Ingestion</u> of food or water contaminated by <u>L₂</u> - <u>Trans-mammary</u> (<i>T.vitulorum</i>) - <u>Trans-placentally</u> (<i>T.canis</i>) - <u>Trans-colostral</u>
3- Host	Cattle, Sheep & Horses	All domestic animals & Human
4- Factors	<u>Age</u> → Majority of disease occurs at <u>2 – 18 months</u>	- Age → <u>Young animals</u> are <u>seriously</u> affected
<u>Signs</u>	1- Acute Form: a- Sudden onset of rapid shallow breathing b- Frequent <u>bronchial</u> cough c- Open mouth breathing with <u>dyspnea</u> d- By <u>auscultation</u> → All parts of lung are involved e- <u>CFR</u> → 75 – 80% (<u>High</u>) 2- Sub-acute Form: a- Sudden onset of rapid shallow breathing b- Frequent <u>paroxysms</u> cough c- Normal or slightly ↑ <u>respiration</u> d- By <u>auscultation</u> → Varies according to area involved e- Marked emphysema <u>dorsally</u> & Bronchitis <u>ventrally</u> e- <u>CFR</u> → <u>Low</u>	1- Acute form: (Only seen in young animals) • Colic, Diarrhea or constipation & poor coat (<u>Due to migration of larva through liver</u>) • <u>Convulsions</u> due to <u>intestinal obstruction & perforation</u> • Dyspnea, cough & verminous pneumonic signs (<u>Due to migration of larvae through the lungs</u>) • <u>Larva migration</u> occurs in <u>dogs & Cats</u> that's associated with <u>fever & hepatomegaly</u> • Unpleasant odor in urine & breath • Meningitis in foals (<u>Due to migration of larvae</u>) • Dysnea & hypothermia in puppies 2- Chronic form: • Diarrhea & Intestinal obstruction
<u>P/M</u>	1- Presence of <u>adult</u> worms in <u>bronchi</u> 2- <u>Enlarged</u> lung due to <u>edema & emphysema</u> 3- Hemorrhagic <u>bronchitis</u> with fluid <u>presents</u> in air <u>passages</u> 4- <u>Enlargement</u> of regional <u>L.Ns</u>	1- Acute form: • Enlarged, congested liver with milk spot (<u>Fibrosis</u>) due to larva migration • Sub-pleural hemorrhage, edema with cyanosis of lung • Pleural cavity contains blood tinged fluid 2- Chronic form: • Presence of large No. of adult worms in lumen of small intestine

<u>Diagnosis</u> 1- Field diagnosis	- Depends on case history, Clinical signs & P/M (No response to treatment of viral & bacterial pneumonia)	- Depends on case history, Clinical signs & P/M (Adult worms may be present in feces with diarrhea)
2- Lab. diagnosis	• <u>Samples</u> : 1- Fecal sample 2- Sputum • <u>Tests</u> : Identification of larvae in feces or sputum with large No.	• <u>Samples</u> : Fecal sample • <u>Tests</u> : Fecal examination by sedimentation or floatation technique for detection of egg (Egg is thick walled with pitted surfaces) • Bacterial & Viral enteritis → Febrile
3- Differential diagnosis	•Bacterial & Viral broncho-pneumonia → respond to antibiotic treatment	
<u>Treatment</u>	1- <u>Levamisole</u> → 8mg / Kg → Orally 2- <u>Ivermectin</u> → 0.2mg / Kg → S/C	1- <u>Ban minth</u> ® → Pyrantel tartarate → 12.5mg / Kg → Orally 2- <u>Piperazine citrate</u> ® → Piperazine citrate → 100 – 300mg / Kg → Orally → Drug of choice & For 3 – 4 successive days & With mild purgative following each dose by 6 hrs. 3- Most of drugs against ascaris don't kill the worm but causes paralysis → verminous ball inside intestine → perforation & rupture of intestine → so purgatives must be administered with low dose of anthelmintic then repeated again till elimination of all worms (to prevent rupture of intestine & death of animal)
<u>Prevention & Control</u>	1- Avoid exposure of young animals to contaminated pasture at weaning 2- Administration of 3 doses of Ivermectin 5 wks. apart in case of exposure to infestation	1- Hygienic measurement → Clean & Dry environment 2- Routine anthelmintic treatment in calves at 3 wks. Of age (single dose) & also the dam should receive a dose of the anthelmintic at dry off period 3- Routine anthelmintic treatment in puppies at 3, 6, 9, 12 wks. of age because puppies can catch the infection through milk, licking or through colostrum

Items	Babesiosis	Anaplasmosis	Theileriosis
Syn.	Tick fever	Gall sickness	Mediterranean Coast fever
Def.	- Acute, sub-acute or chronic infectious disease of cattle & buffalo caused by 4 spp. of babesia & <u>transmitted by ticks</u> •<u>The acute form characterized by:</u> 1- Fever & anorexia 2- Intravascular hemolysis that causes → anemia, hemoglobinemia, hemoglobinuria, jaundice, enlargement of spleen & death •<u>The chronic form characterized by:</u> 1- Anemia & weight loss 2- Poorly defined clinically	- <u>Tick borne disease</u> of ruminants caused by Rickettsia "Anaplasma spp." <u>Ch. by:</u> - Fever - Weakness - Anemia - Emaciation & jaundice	- Per-acute, acute, sub-acute or chronic infectious disease of cattle & buffalo caused by Theileria annulata that <u>transmitted by ticks</u> & <u>Ch. By:</u> - Fever - Enlargement of peripheral L.Ns - Wasting & progressive anemia & jaundice
Etiology	•Babesia bigemina & Babesia major → <u>Large size</u> - Babesia bovis & Babesia divergens → <u>Small size</u> - Babesia bigemina & Babesia bovis → Present in <u>Egypt</u> - Babesia bovis → More pathogenic & during treatment a 2nd dose of babesicidal agents is needed	•Anaplasma spp. - Obligatory intra-cellular M.O that multiply by binary fission (<i>Rickettsia</i>) - A.marginale (<i>mild</i>) & A.centrale (<i>more pathogenic</i>) → The most common - Anaplasma spp. spherical-shaped bodies (May be comma shape <u>or</u> ring forms)	•Theileria annulata - It has <u>3 stages</u>: Piroplasm, Macro-schizont & Micro-schizont - Piroplasm stage is found in the RBCs
<u>Epidemiology</u> 1- Source of Infection	- Infected ticks - All the stages in one-host tick transmit the disease - Adult & Nymph stages in two-host tick only transmit the disease - Adult stage in three-host tick only transmits the disease		
2- Mode	- <u>Biologically</u>: by biting of ticks <u>either</u> trans-ovarian <u>or</u> stage to stage - <u>Mechanically</u>: by contaminated needles, blood transfusion & Intrauterine transmission		- <u>Biologically</u>: (stage to stage only) - <u>No mechanical</u> transmission

3- Host	- All bovines	- Cattle, buffalo, sheep, goats & horses	- Cattle & buffaloes
4- Factors affecting susceptibility	a- <u>Age</u> : Calves are less susceptible than adult (<i>Age resistant is up to 9 months</i>) b- <u>Season</u> : ↑ Incidence during summer months c- Cattle are more susceptible than buffalo d- <u>Breeds</u> : Foreign are more susceptible (<i>Host – specific protozoa</i>)		
Signs	1- Morbidity rate: 40% 2- Mortality rate: 60% 3- Course: 2 – 3 wks. 4- <u>Per-acute form</u> : a- There's fever followed by sudden death of animal b- Highly susceptible animals for this form 6- <u>Acute form</u> : a- Fever (40 - 42°C) b- Mucous membrane is congested 1 st (due to fever) then pale (due to anemia) then icteric (due to Splitting of Hb) c- Urine becomes dark red to brown e- Tachycardia due to anemia g- By treatment, temperature will ↓ within 24 – 48 hrs. h- If there's no treatment → subnormal temp. before → bad prognosis & death 7- <u>Sub-acute form</u> : as acute but at lesser degree 8- <u>Chronic form</u> : ↓ no of M.O without activity M.O	1- Morbidity rate: 40% 2- Mortality rate: 60% 3- Course: 2 – 3 wks. 4- <u>Per-acute form</u> : •Pyrexia & anorexia •Anemia with pale m.m •Fatal in cattle that are over 3 years 5- <u>Acute form</u> : •Fever (41°C), anemia (<i>pale m.m</i>) •Laboured breathing, Enlarged L.Ns & jaundice (<i>Icteric m.m with dull foamy yellow urine</i>) •Abortion in ♀ & loss of fertility in ♂ 6- <u>Chronic form</u> : •Progressive emaciation	1- Morbidity rate: 40% 2- Mortality rate: 60% 3- Course: 2 – 3 wks. 4- <u>Per-acute form</u> : •Pyrexia, anorexia, depression & weakness then death within 3 – 4 days 5- <u>Acute form</u> : (<i>Commonly seen in endemic areas</i>) (a) Intermittent fever, corneal opacity & swelling of superficial L.Ns (b) Ruminal stasis (c) Anemia → Pale m.m & ↑ H.R. → Hbemia, bilirubinemia & bilirubinurea → Jaundice (d) Constipation during fever Then after dropping of fever → Bloody Diarrhea occurs 6- <u>Sub-acute form</u> : (a) Intermittent fever for 2 – 4 wks. With progressive anemia & jaundice (b) Death occurs after a long period 7- <u>Chronic form</u> : •As sub-acute but more prolonged

P/M	- The carcass is infested with ticks - Marked jaundice with dark brown spleen & <u>splenomegaly</u> - Congested liver & Kidney - U.B contains red-brown urine	- The carcass is emaciated with icteric tissues - The liver is <u>deep orange</u> in color - Soft spleen & Congested kidneys - L.Ns are enlarged	- Pale m.ms & icteric tissues - Enlarged, congested & edematous L.Ns & Spleen - Hemorrhagic ulcerations of the abo-masum - Soft pulpy kidney
♦Diagnosis 1- Field diagnosis	- Depends on case history, Clinical signs & P/M (Babesiosis → <u>Presence of tick + red urine</u>) (Anaplasmosis → <u>Presence of tick + severe icterus</u>) (Theileriosis → <u>Fever + Presence of tick + enlarged L.Ns + Corneal opacity</u>)		
2- Lab. diagnosis	•Sample: 1- Blood smears from ear V. 2- Ticks from diseased animals 3- Serum 4- Spleen •Tests: 1- Thin blood film is made & stained by Giemsa stain → For detection of babesia inside <u>RBCs</u> 2- Hemolymph & egg smears "by crushing of eggs" → Confirm presence of babesia 3- Hematology → Detection of anemia (<u>PCV is lower than 15%</u>) 4- Serology → <u>CFT, ELISA & IHA</u> 5- Impression smear from spleen 6- Injection of blood from suspected cases in splenectomized animals (<u>For detection of chronic cases</u>) (<u>Transmission test</u>)		
3- Differential diagnosis	•Differential diagnosis of babesiosis:- •Bacillary Hburea → Caused by <u>Cl. Novyii type (D)</u> + <u>Absence</u> of tick + <u>presence</u> of fasciola in bile duct + <u>Yearling animal</u> while in babesia the animal ages from <u>1 – 2 years</u> •Pyelonephritis → Caused by <u>C.pyogens</u> + Presence of blood <u>at the end</u> of urination While in case of babesiosis the blood presents <u>mixed</u> with urine •Leptospirosis → <u>Newly born</u> animal + acute hemolytic <u>septicemic</u> disease •Post-parturient Hburea → <u>Winter</u> season + <u>after</u> parturition + <u>hypophosphatemia</u> •Theileriosis & Anaplasmosis → Hburea is <u>rare</u> to occur	♦Diseases causing Corneal opacity: - MCF ↔ DNA V. - IBK → No fever + morexilla bovis - BVD → Diarrhea - IBR → Respiratory manifestation	
Treatment	1- Imidocarb diproprionate salt (Imizol ®) 12%	•Specific treatment for diseased animals: 1- Imidocarb diproprionate salt (Imizol ®)	1- Buparvaquone (Butalex ®) 1cc / 20Kg (I/M)

Treatment	<u>Therapeutic dose</u> → 1cc / 100Kg (S/C) •<u>Sterilizing dose</u> → 2.5cc / 100Kg (S/C) •Therapeutic dose is used for induction of enzootic stability 2- Dimenazine aceturate (Berenil ®) 7% (15cc/300Kg) (1cc / 20 Kg) 3- Quinuronium sulfate (Acaprin ®) 5% 1cc/50Kg (S/C in dewlap) ♦Flushing of liver by Hypertonic soln. that acts as <u>diuretic</u>	12% → 2.5cc / 100Kg (S/C) 2- Long acting oxytetracycline (Terramycin LA ®) → 1cc / 10Kg (I/M) (These treatments don't cause sterilization of M.O. to eliminate it & prevent relapsing & reinfection one of the following should be done) •Daily dose of short acting tetracycline (10mg / Kg) (I/M <u>or</u> I/V for 10 days) •Daily dose of Imidocarb (3mg / Kg) (For 2 days) or (4mg / Kg) as one dose	•Acts on schizont *** 2- Oxytetracycline (Terramycin LA ®) → 1cc / 10Kg (I/M)
Immunity	•Maternal Abs last for 1st 3 months of age •Age resistance follows it until 9 months of age	•After recovery → Long-life immunity •Calves from recovered ♀ → resist the disease for 6 months	- Recovery occurs with long-lasting immunity <u>but</u> some cases remain carriers
Prevention & Control	<u>1- Tick control:</u> •By using OPC [Acaricides] either dusting, spraying, dipping, pour-on or spot-on •Resistant cattle & genetic manipulation •In one host tick: OPC should remain on host for 3 wks. & dipping should be once a week <u>2- Control of disease by treatment:</u> as before <u>3- In endemic areas:</u> •Chemo-immunization •Therapy by sterilizing dose <u>[Vaccination for Babesiosis]</u> •<u>Monovalent</u> or <u>Bivalent vaccine</u> (contains B.bovis & B.bigemina) → Live organisms that give immunity for 1 year <u>[Vaccination for Anaplasmosis]</u> •<u>Live A.marginale:</u> Used in animals that are under 1 year (Disadvantage: Creation of large population of carrier animals that can spread the disease) •<u>Live A.centrale:</u> it may cause inapparent mild disease •Pasture change •Covering the ground by quick lime		

(Animal should not take imizol before vaccination at least for 8 wks. before vaccination)

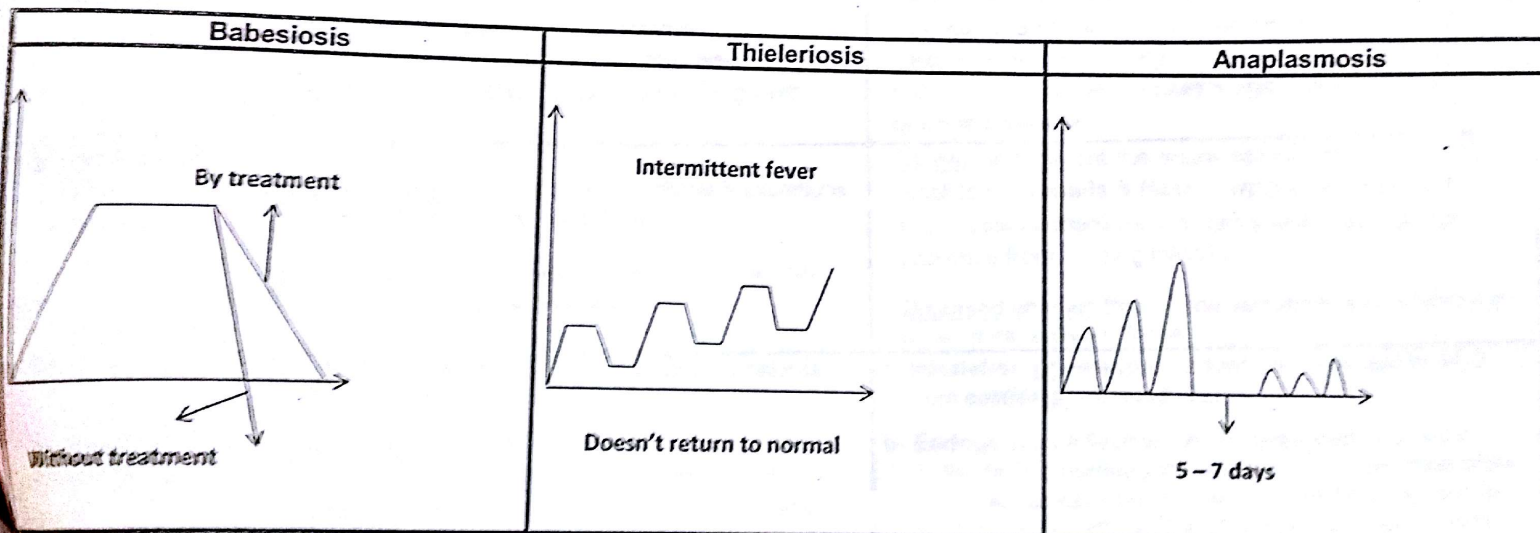
•**N.B/** The Abs that are produced by **REC** against Anaplasma is similar to those Abs that can act on RBCs so it attacks RBCs causing **severe destruction & anemia**

■ **Treatment of piroplasmosis:**

• Berenil + Tetracycline (Berenil acts on babesia while tetracycline acts on theileria "2-3 doses")

• **N.B/**

- 1- Diarrhea is bloody due to ulcerations that occurs in payer's patches
- 2- Intermittent fever occurs in **acute or sub-acute** form (*Doesn't return to normal*)
- 3- Recurrent fever occurs in **Chronic** form (*Returns to normal*)



Items	Mange	Ring Worm	DPH
Syn.	Scab ; Itch	Dermatophytosis	
Def.	chronic infectious disease of all domestic animals caused by different pathogenic spp. of mites, characterized by: Dermatitis, Encrustation & Itching of skin	Superficial fungal disease of camels Ch. by: Affects camels that are less than 3 years, formation of circular area of alopecia, Self limiting disease that heals with or without crust formation	Acute or chronic infectious disease caused by G+ve Fungus-like bacterium Ch. by: formation of skin lesions
Etiology	- Sarcoptic mange caused by Sarcoptes scabiei [Head mange] - Psoroptic mange caused by Psoroptes spp. (Ovis, equi,...) [Body mange] - Chorioptic mange caused by Chorioptes bovis, ovis & equi [Tail & leg mange] - Demodectic mange (Follicular) caused by Demodex spp. [Anywhere]	- Trichophyton spp. & Microsporum spp	- Dermatophilus congolensis - G+ve, aerobic filamentous rods
♦Epidemiology			
1- Source of Infection	- Infested animals & their bedding		- Active lesions of diseased or carrier animals
2- Mode	- Direct contact → between different hosts - Indirect contact → Via various objects which have been in contact with diseased animals as:blankets, grooming utensils, bedding materials & attendants		- Direct or indirect contact between diseased & healthy animals through damaged or abraded skin
3- Host	- All domestic animals	- Cattle, buffalo, sheep, goats & horses	- Sheep, goat, horses, cattle, buffaloes & Man
4- Factors affecting susceptibility	- occurs in adult animals - Season → most prevalent in winter & autumn season	- occurs in adult animals - Season → the disease is most prevalent in winter & autumn season	- Shearing is a predisposing cause - High temperature & humidity play important roles

Signs	1- Sarcoptic mange: •Cattle → Starts in head & extend in body •Sheep → Starts from nostrils & spread (Notifiable disease causes 50% wool loss) •Camel → Starts in axilla & extend by biting •Pets → Alopecia & erythema 3- Psoroptic mange: •Sheep → Nodules found on belly •Equine → Occurs at area of saddle & causes ulcers as 2ndry lesion •Ear mites → brownish exudate (<i>Common in cats, dogs & rabbits</i>) 4- Chorioptic mange: •Cattle → Occurs in perineum, tail, legs, scrotum, hind limb & udder 5- Demodectic mange: It makes nodule-like structure inside skin	1- Dry, circular, hairless patches with thick, scaly, greyish-whitish encrustations 2- Appears mostly on head, neck, shoulder, leg & flanks 3- It begins small (1 – 2 cm in diameter) & gradually gets bigger & may merge 4- There's no itching	a- Appear 1st on dorsal part of body, face, ears, lips & muzzle (Hair becomes paint brush – like) b- In cattle, there's thick horny crust that vary in color from creamy to brown & sometimes is painless & if there's dermatitis; it heals with crust formation
P/M	Non specific		
Treatment	1- Systemic treatment → Ivermectin (Ivomec 0.2mg /kg) (S/C) & not used for lactating cows 2- Dipping 3- For non-lactating animal: •Diazinon 0.01 – 0.02% •Malathion 0.5%	1- Iodine soln. 2% 2- Gresofluvin [<i>Orally for 2 wks.</i>] •In Cattle → 50 mg / Kg •In horse → 25 mg / Kg "Half the dose as it causes gastritis" •In Camel → 12 mg / Kg •In Dog → 20 mg / Kg	1- tetracycline (I/M) for 3 days (70 mg / Kg) 2- Procaine pencillin (70000 I.U / Kg)

◆Diagnosis

1- Lab. diagnosis	•<u>Sample:</u> - Skin scraping from the periphery of lesions & deep scarping - Skin biopsy is helpful especially when demodectic mange is suspected •<u>Tests:</u> after collection digestion must occur in 10% KoH soln. then gentle heating for liquefaction of keratin of skin then examination under low power of microscope	•<u>Sample:</u> 1- Skin scraping 2- Hair from edges of hairless patches •<u>Tests:</u> 1- Direct examination under microscope → Small Glistening refractile granules 2- Culturing on SDA → Characteristic colonies	•<u>Sample:</u> Scabs softened with water •<u>Tests:</u> 1- Culturing of M.O on SDA → Characteristic culture 2- Staining of smears by Giemsa stain & detection under microscope
2- Differential diagnosis	Irregular shape Itching At any age Parasitic disease	Circular shape No itching At young ages Fungal disease	Irregular shape No itching At any age Bacterial disease
Prevention & Control	1- Removal of infection's source (<u>Animal, bedding, utensils or any other inanimate object</u>) 2- Periodical cleaning & treatment of animals & their houses 3- Newly introduced animals to herd should be free from infection	1- Healthy camels must be away from infected camels 2- Clean & disinfect stables by strong disinfectant as 1% NaOH 3- Vaccination by cattle vaccine at the age of 30 days & then booster it after 2 – 3 wks.	1- Controlling ticks & insects 2- Isolation between healthy & infected animals 3- Dipping in 0.2 – 0.5% Zn sulphate after shearing

Items	Actinomycosis	Actinobacillosis
Syn.	Lumpy jaw	Wooden tongue
Def.	- Sub-acute or chronic infectious debilitating disease of cattle caused by <i>Actinomyces bovis</i> & Ch. by: - Purulent granuloma in Hard tissue**** [Mandible & Maxilla]	- Chronic infectious disease of cattle caused by <i>Actinobacillus lignieresii</i> & characterized by: - Purulent granuloma in soft tissue [Specially tongue in cattle; lips & cheeks in sheep]
Etiology	• <i>Actinomyces bovis</i> [G+ve filamentous anaerobic rods, grows in presence of 10% CO ₂]	• <i>Actinobacillus lignieresii</i> [G-ve rods, non-motile & non-spore forming]
• Epidemiology		
1- Source of Infection	- M.O is normally inhabitant in soil & upper respiratory & digestive tract	
2- Mode	- Via abrasions & wounds by sharp objects as sticks or owns	
3- Host	- Accidental during eruption of teeth	
4- Factors affecting susceptibility	Cattle & sheep	
	- Feeding of dry & coarse food predispose the infection - Disease affects young cattle mainly during eruption of teeth	- Feeding of dry & coarse food predispose the infection - Disease affects adult cattle mainly
Signs	1- It affects bony structures mainly lower jaw (More than upper jaw) 2- Painless immovable swelling & abscess of jaws (While in case of woody tongue, there's ulcers & pain) 3- Discharge of pus that contain sulfer granules " Sand-like granule " as woody tongue 4- It may affect other tissues as lung, liver & brain	• Cattle:- 1- Excessive salivation with offensive odour from mouth & tongue 2- Submandibular Ln. is swollen with protruded tongue from mouth 3- Tongue losses the elasticity & becomes swollen & hard to touch (Woody tongue) • Sheep:- 1- Firm nodules present on lower lip & cheeks that discharge purulent exudate 2- Sheep at advanced stages become emaciated because of unable to eat

♦Diagnosis	
1- Field diagnosis	softening of bone - presence of sinuses contain pus - necrosis & softening of tongue with pus at site of infection - Depends on case history, Clinical signs & P/M
2- Lab. diagnosis	♦Sample: - Pus & necrotic c tissues from lesions ♦Tests: 1- Isolation & identification of M.O on blood agar at 37°C with 5 – 10% CO₂ [<i>In case of Actinomyces</i>] 2- Detection of M.O under the microscope using 10% NaOH on glass slide
3- Differential diagnosis	Corynebacterium infection → Greenish thick exudate while in LJ & WT the exudate is sandy Actinmycosis → Lumpy jaw
Treatment	•Streptomycin (25mg / Kg) I/M [<i>or injection inside the mandible in case of Lumpy jaw</i>] •Na iodide 10% (gm. / 14 Kg) I/V then repeated after 10 – 14 days to prevent granuloma •K iodide (6 – 10 gm.) daily for 10 days <u>orally</u> (<i>Injection of K iodide is fatal</i>)
Prevention & Control	1- Detection of infected animals by clinical signs & bacterial culture 2- Isolation & culling of infected animals with discharging lesions 3- General hygienic measures

Items	CBPP	Pasteurellosis
Syn.	Lung plague	Stockyard pneumonia – Shipping Fever
Def.	- Acute, sub-acute or chronic contagious disease of cattle & buffalo caused by <i>Mycoplasma mycoides</i> subsp. <i>mycoides</i> & Ch. By: - Fever & respiratory manifestation	- Acute infectious respiratory disease of cattle, buffalo, sheep & Pigs caused by <i>Pasteurella multocida</i> & Ch. By: - Septicemia** - Signs of broncho-pneumonia & High mortality rate
Etiology	• <i>Mycoplasma mycoides</i> subsp. <i>mycoides</i> - Deprived of cell wall so it resists B-Lactam antibiotic group as penicillin - Pleomorphic - It can't resist the environmental factors - It survives in frozen tissues for a long time - Fastidious M.O & needs special media for growth (<i>Rich in cholesterol</i>)	• <i>Mannheimia multocida</i> (<i>Pasteurella multocida</i> sero-type B & E) - G-ve & Capsulated - It's normal inhabitant in the upper respiratory tract & can't survive for a long time outside the body - Stained by Giemsa stain & detected microscopically by its characteristic bipolarity - It doesn't grow on McConkey's agar but it grows on blood or chocolate agar
↑ Epidemiology 1- Source of Infection	- Diseased cattle through all the secretions & excretions e.g.: urine, milk & genital secretions - Carrier cattle are the major source because they shed M.O from ruptured sequestra	- Carrier animals are the major source because the M.O is localized in Tonsils & Naso-pharyngeal mucosa & mucociliary adherence with IgA & fixed macrophages prevent it from causing infection - Diseased animals through the secretions & excretions e.g.: urine, milk, saliva & feces
2- Mode of transmission	- a- Inhalation of infected droplets either by direct or indirect contact - b- Trans-placental infection may also occur - c- Infection may be transmitted for up to several kilometers [10 Km] by cattle movement (<i>airborne – aerosol infection</i>)	- a- Inhalation or ingestion of food contaminated by M.O from carrier or infected animal - b- Endogenous infection (Auto-infection) may occur → as the M.O is normally inhabitant in the upper respiratory tract & left apical lobe and during ↓ the immunity due to environmental factors, The M.O gains success to lung
3- Host	- Cattle while buffaloes are rarely susceptible	- Cattle & buffaloes
4- Factors affecting susceptibility	a- Cattle are more susceptible while buffaloes are rarely susceptible	a- Age: 6 – 12 months are more susceptible b- Environmental stress → Cold & wet weather & Noxious gases e.g. Ammonia

	b- Unhygienic conditions enhance the infection	c- <u>Concurrent infection</u> by RP or PI ₂ enhance the infection d- <u>Spp.</u> → Buffaloes are more susceptible than cattle
Signs	1- Morbidity rate: 90% 2- Mortality rate: 50% 3- <u>Acute form</u>: •Fever, with lobar pneumonia •Dry cough then moist painful cough •Expiration is accompanied by grunting due to pleurisy •Characteristic attitude → Elbow turned out, arched back & extended head •By percussion → dull sound can be noticed in the low area of thorax (<u>ventral area</u>) •By auscultation → pleural friction sound at early stage & moist gurgling crackles at the late stage •Death occurs due to anoxia & toxemia 4- <u>Sub-acute & Chronic form</u>: •Signs are less marked •Severe arthritis & swelling of joints in young calves •No. of recovered animals retain infected sequestra in their lungs & considered as a major & dangerous source of infection •Chronic cough with grunting in case of <u>exercise</u>	1- <u>Per-acute form</u>: Death within few hrs. of illness 2- <u>Acute form</u>: •Fever (41 - 42°C) •Moist cough •Nasal discharge that begins serous then muco-purulent •Warm & painful swelling & edema of head, throat, brisket, perineum & Limbs → that result in dyspnea & death due to edematous factor released by bacteria •By Auscultation → moist rales & dry rales •Anterior ventral pneumonia (Lobular pneumonia) [Sudden death may be accompanied with pneumonia with bloody diarrhea due to ulcers in intestine caused by bacteremia]
P/M	1- <u>Thoracic cavity</u>: •Fibrinous pleurisy with adhesion of pleural layers (<u>Diagnostic</u>) •Yellowish or turbid exudate presents on pleural cavity (<u>30 L</u>) 2- <u>Lung</u>: •Marbled appearance due to hepatization (<u>Diagnostic</u>)	- Edema of head, throat & brisket - Presence of straw-colored fluid that extend from S/C into muscles - Presence of Blood-tinged fluid in thoracic, abdominal & pericardial cavities - Congested lungs with evidence of broncho-pneumonia - Hemorrhagic gastro-enteritis

	3- Chronic cases: Sequestrum (Greyish necrotic area + Fibrous capsule) **	
• Diagnosis		
1- Field diagnosis	- Depends on case history, Clinical signs & P/M	
2- Lab. diagnosis	•Sample: 1- Lung lesions, Pleural fluid & L.Ns 2- Frozen exudate** 3- Paired serum sample •Tests: 1- Isolation & Identification of M.O on <u>PPLO</u> media 2- Direct microscopical examination → staining by <u>Giemsa stain</u> 3- Serology → <u>CFT & ELISA</u> *CFT is the best for detection of carriers* 4- 2 CFT with one month interval → vaccinated animals will have ↓ titre of antibodies <u>while</u> carriers will have constant ↑ titre of antibodies	•Sample: 1- Retro-pharyngeal L.N 2- Lung lesions, Heart blood *In case of septicemia* & Spleen •Tests: 1- Isolation & Identification of M.O on <u>Blood</u> or <u>Chocolate</u> agar at 37°C / 24 – 48 hrs. & colonies appear <u>moderate</u> size, <u>round</u> & <u>Grayish</u> with <u>characteristic odor</u> & <u>hemolytic</u> 2- Direct microscopical examination → staining by <u>Giemsa stain</u> & detection of <u>bipolarity</u> that lost by culturing 3- Serology → HA 4- Lab. Animal inoculation → Samples are injected <u>I/P in rat</u> → Death after <u>24 - 36 hrs.</u> 5- Differentiation between salmonella & pasteurella → both grow on blood agar *Pasteurella causes hemolysis on blood agar* while salmonella not pasteurella grows on macConkey's agar
3- Differential diagnosis	T.B & Pasteurellosis → by isolation of M.O IBR & PI ₂ → Culturing Of V.	• Anthrax → Mcfedyan reaction
Immunity	•Recovered animals are <u>immune</u> but 25% of them are Carriers •Vaccination gives immunity for <u>2 years</u> (Vaccinated animals give false +ve result by CFT)	- Natural infection gives Long-lasting immunity
Treatment	•<u>Generally</u>, it's not used because carriers are developed after therapy in exotic areas •Tylosin (10mg / Kg) (every <u>12 hrs.</u> for <u>3 successive</u> days)	• Mass treatment preferred in mycoplasmal diseases & pasteurella due to short IP → So, animals must be examined every 4 hours → animals with ↑ temperature should be isolated & treated

	• Spiramycin (10 – 50mg / Kg) (For 3 successive days)	• Oxytetracycline (1cc / 10Kg) (For 3 successive days & continues for 2 days after disappearance of signs) • Sulphadiazine (200mg / Kg) in water • Tetracycline + trimethoprim in food • Noflor (1CC / 7.5 Kg) every 48 hrs. • Draxxin (1CC / 40Kg) (S/C) • Dexamethasone (10 – 20 mg / Kg) (I/V) "Anti-inflammatory"
Prevention & Control	a – Detection of infected animals by clinical signs b - Detection of Carrier animals by Serology c – Isolation of infected animals d – Controlling the animal movement e – Detected carriers should be discarded f – Disinfection of place & equipment by preventing manure contamination of food & water g – Proper housing of Animals with good ventilation of the house h - Avoid stress & exhaustion of animals i - Increase the immunity of animals by vaccination j – New animals must be isolated for 30 days & examined for presence of carriers k – Newly purchased animals should be from uninfected known herds or vaccinated herd l - In free countries; stumping out must be done	1- General:- a- Choose healthy animals b- Reduce stress during animal handling c- Vaccination of calves 1 – 3 wks. before shipping 2- During shipping:- a- Avoid over-crowding b- Avoid hard driving c- Sheltering of animals in case of bad weather d- Periods of rest in case of long journeys with administration of plenty food & water 3- On arrival:- a- Feed of 1st 2 days must be similar to that before shipping b- Avoid mixing between new arrivals & native animals c- Mass treatment of animals with long acting antibiotic as prophylactic 4- If disease occurs:- a- Check the temperature of the animal 3 times daily every 4 hrs. because of short IP & isolate & treat any case b- If the antibiotic is short acting antibiotic, it should remain administered 4 days after disappearance of clinical signs c- Administration of supportive treatment as Vitamin E, Zn⁺² & Se⁺² that ↑ immunity of respiratory tract 5- Prevent reoccurrence:- - By vaccination of animals
	• Vaccine program:- • Type: Live attenuated virulent vaccine (prepared from pleural exudate that cultured in broth)	

•**Route:** S/C at the tip of tail •**Immunity:** 1 - 2 years

•**N.B/** Calves that are less than 2 m. are not vaccinated as this vaccine causes hygroma

•**N.B/** Anti-pyritic is administered if the temperature reaches $40 - 41^{\circ}\text{C}$ while in case of mild fever ($39 - 39.5^{\circ}\text{C}$); Anti-pyritic should not be administered as it's a defense mechanism of the body

■ **Vaccine program (1):-**

•**Name:** HS oil adjuvant vaccine

•**Dose:** 2ml in cattle & buffalo & 1ml in sheep

•**Type:** Killed oil emulsion

•**Route:** I/M in hind quarter

•**Booster dose:** Every year

■ **Vaccine program (2):-**

•**Name:** PH - PM bacterin

•**Dose:** 2ml → 2 wks. → 2 ml

•**Age:** at 3 months of age

•**Route:** S/C

•**Booster dose:** Prior stress condition (3 wks.)

•One shot of bacterin & toxoid 2ml → S/C or I/M